

PHOTOPSOID MUTILLIDS COLLECTED BY DR. K. A.
SALMAN AT EAGLE LAKE, CALIFORNIA.

(Hymenoptera)*

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Dr. K. A. Salman, Berkeley, California, had the unusual experience of observing a flight and the mating of a species of *Photopsis* at Eagle Lake, Lassen National Forest, Lassen County, California, July 30 and 31, 1936. He collected several pairs in copulation and a series of both males and females. The material was sent to me for study and proved to be a new species, the male closely related to *pedatus* Baker and the female to *pygmaea* Blake. Baker's type of *pedatus* has been available for comparison. One specimen of a second species of male, *Odontophotopsis*, and three specimens of a second female were also collected, but not in copula. It is probable that this second male and female are the two sexes of one species, but since this is not certain they are described separately. I am pleased to acknowledge my appreciation to Dr. Salman for the privilege of studying and describing this material.

Photopsis salmani Mickel, n. sp.

Male. Ferruginous throughout, except the scape yellow, the flagellum fuscous, the integument beneath felt lines of second tergite black, and the legs only slightly paler than the body, almost concolorous; clothed throughout with pale, sparse, erect hairs, except the front, vertex, mesonotum, scutellum and second abdominal tergite with the hairs very pale ferruginous; second tergite with a thick fringe of pale, plumose hairs at the posterior margin, the remaining tergites with thin fringes of similar hairs; mandibles edentate at the tip and with two small teeth just within from the tip, with a strong carina the entire length on the dorsal surface, strongly emarginate beneath, forming a blunt tooth subtending the emargination proximally; clypeus considerably depressed below the dorsal surface of the mandibles, its surface slightly concave, the posterior margin without a median tubercle; scape shallowly punctate, with a weak, longitudinal carina anteriorly; first segment of flagellum four-fifths the length of the second; antennal scrobes carinate on the inner half, with a small, transverse tubercle slightly anterior to the outer end of

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the carina; front with a shallow, median sulcus extending from a small pit anterior to the median ocellus to a point between the antennal tubercles; front, vertex and genæ with small, sparse punctures; ocelli large, the distance between the eye margins and the lateral ocelli equal to about one and one-half times the greatest diameter of the latter; lateral areas of pronotum distinctly reticulate, the median area with moderate punctures; mesonotum with parapsidal furrows distinct their entire length, and with moderate, separated punctures throughout; scutellum coarsely reticulate, the meshes small; enclosed area of dorsum of propodeum consisting of a pair of elongate, subovate areas, each area about twice as long as wide; dorsum of propodeum evenly rounded into the posterior face and both broadly, distinctly reticulate except the enclosed area, the meshes large; propleuræ not defined anteriorly by a carina, rugoso-punctate; ventral area of mesopleuræ distinctly reticulate; dorsal area of mesopleuræ with small, sparse, weak punctures, except the posterior margin behind the ridge closely, moderately punctate; metapleuræ glabrous, impunctate; sides of propodeum glabrous, weakly, indistinctly reticulate; mesosternum entirely unarmed; tegulæ small, convex, glabrous, impunctate, except the inner margin punctate and with ferruginous pubescence; first abdominal segment long, about two-thirds the length of the hind femora; first tergite strongly punctate, the punctures moderately large, close but distinct medially, becoming closer and confluent laterally; second tergite glabrous, with small, very sparse punctures; remaining tergites weakly punctate, the punctures small and shallow; pygidial area not margined laterally, glabrous, very weakly aciculate, the tergite with a thick fringe of pale, short hairs at its posterior margin; median, longitudinal carina of first sternite crenulate; second sternite with moderate, indistinct, separated punctures and with short, vestigial felt lines laterally; remaining sternites with small, weak punctures; wings subfuscous on the distal half; length of cell 2nd R_1+R_2 on the costal margin equal to the length of the stigma; cell R_5 receiving vein M_{3+4} one-third the distance from base to apex; cell R_4 obsolete; vein M_2 obsolete; vein m-cu anterior to vein M_4+Cu_1 on vein Cu_1 ; calcaria ferruginous. Length, 13 mm.

Female. Entirely ferruginous, the legs concolorous with the body; head clothed with sparse, pale, recumbent and erect pubescence, except the vertex posteriorly with sparse, golden ferruginous pubescence; thorax clothed with sparse, long, pale pubescence, except the dorsum with sparse, golden ferruginous pubescence; abdomen clothed with sparse, pale pubescence, except the second tergite excluding narrow lateral areas, with sparse, golden ferruginous pubescence, and all the segments above and beneath, excepting the first sternite, with thick, posterior, marginal fringes of pale, plumose hairs; head distinctly narrower than the thorax, rounded posteriorly; mandibles slender, edentate at the tip and

with a small tooth within, strongly excised beneath near the base forming a blunt tooth subtending the excision; antennal tubercles distinctly, but not widely, separated; first segment of flagellum slightly shorter than the second and third united, the second distinctly shorter than the third; antennal scrobes distinctly carinate above; front, vertex and genæ with moderate, very close punctures, the puncturation more or less obscured by the pubescence; distance between posterior margin of eyes and posterolateral angles equal to somewhat less than half the greatest diameter of the eyes; thorax as long as broad, slightly narrowed at the propodeal spiracles and behind; humeral angles not prominent; dorsum of thorax with very dense, confluent, moderate punctures, becoming subscabrose on the dorsum of propodeum; posterior face of propodeum with moderate, distinct punctures on the disk; scutellar scale absent; propleuræ glabrous, impunctate, except the dorso-ventral ridge broad, densely punctate, with very long, erect, pale hairs; metapleuræ glabrous, except punctate ventrally; sides of propodeum with moderate, shallow, indistinct punctures; first abdominal segment very small, short, distinctly constricted from the second; first tergite densely punctate; second tergite with moderate punctures, dense and confluent on the anterior fourth, close on the lateral fourths, separated and shallow on remainder of tergite; tergites three to five with small, distinct punctures; pygidial area very large, covering nearly all of last tergite, distinctly margined laterally, distinctly strongly granulate throughout, with an obscure appearance of longitudinal striations in certain lights; first sternite elevated along the longitudinal median line, but not distinctly carinate; second sternite with a low, median, longitudinal ridge on the anterior third, with moderate, distinct, close punctures; sternites three to five with small, distinct, close punctures; legs clothed with long, pale hairs; calcaria ferruginous. Length, 7 mm.

Holotype. Male, Cat. No. 52781 United States National Museum, Coll. No. 36-7, Eagle Lake, Lassen County, California, July 30, 1936 (K. A. Salman), (*in copula* with allotype). Allotype: female, Coll. No. 36-7, Eagle Lake, Lassen County, California, July 30, 1936 (K. A. Salman). Paratypes; five males, five females (*in copula*), Coll. No. 36-7, Eagle Lake, Lassen County, California, July 30, 1936 (K. A. Salman); seventeen males, forty-nine females, Coll. No. 36-8, Eagle Lake, Lassen County, California, July 31, 1936 (K. A. Salman), in collections of United States National Museum, University of Minnesota and K. A. Salman.

Dr. Salman's notes, made at the time the specimens were collected, are as follows:

"Coll. No. 36-7; Eagle Lake, Lassen National Forest, Lassen County, California, July 30, 1936. Sandy beach on north shore of lake. Strong wind blowing from southwest. Time of collection from just before sunset to dusk—6 to 8 p. m. Many females crawling over sand, occasionally digging into loose sand. Seemed to prefer margins of patches of low grass or small open sandy spots. Few found actually within the larger patches of grass. Males on ground and in flight in large numbers. They fly low over ground and approach towards females from windward, several usually flying into the wind in the vicinity of each female. One usually comes on female and copulates, the act taking only a few seconds. The other males remain around but I observed no second copulation by another male and the same female. Six pairs taken in the act of copulation. The attachment of the pair is quickly broken when they are disturbed. Coll. No. 36-8; Eagle Lake, Lassen National Forest, Lassen County, California, July 31, 1936. Same species as in Coll. No. 36-7 in flight and crawling on ground. Much less abundant than on previous evening although time about the same. August 1, 1936, 1 to 3 p. m. Bongberg and Eaton noted neither males nor females in evidence at this time of day although *Dasymutilla pacifica* var. *aureola* present on hot sand. August 4, 1936. No flight occurred on this date late in the afternoon although conditions about the same as on July 30 and 31. Apparently period of flight is short."

The male is closely related to *pedatus* Baker described from southern California, but differs as follows: clypeal tubercle (a small, blunt, median tubercle on the posterior margin of clypeus in *pedatus*) absent, legs ferruginous, almost concolorous with the body (in *pedatus*, legs yellow, much paler than the body), distal half of wings subfuscous (in *pedatus*, tinged with yellow, subhyaline), and mandibles distinctly broader distally than at narrowest point of emargination (in *pedatus*, not noticeably broader distally than at narrowest point of emargination). The felt lines on the second sternite of many of the male paratypes are so vestigial that they appear to be absent. The Baker types of *Photopsis* have been available for study and comparison with the type material of *salmani*; the following couplets may be used to separate *pedatus* Baker, *ingenuus* Baker (very closely related to *pedatus*) and *salmani*:

1. Posterior margin of clypeus with a median, blunt tubercle; legs yellow, paler than the body; wings subhyaline.....2

- . Posterior margin of clypeus not elevated medially, not tuberculate; legs ferruginous, concolorous with the body; wings subfuscous *salmani* n. sp.
- 2. Clypeal tubercle small, obscure; ventral area of mesopleuræ shallowly, indistinctly punctate..... *ingenuus* Baker
- . Clypeal tubercle moderate, distinct; ventral area of mesopleuræ distinctly reticulate..... *pedatus* Baker

The female is related to *pygmaea*. No specimens of the latter species are available for comparison at the present time and the description of *pygmaea* is not very helpful in indicating differences between the two. *Pygmaea* is said to have white, erect pubescence on the dorsum of the thorax and abdomen, while *salmani* is conspicuously golden ferruginous pubescent on the posterior part of vertex, and on the thorax and abdomen above. The type of *pygmaea* is in the collections of the American Entomological Society and bears a locality label, "Boulder, Colorado."

Odontophotopsis atripes Mickel, n. sp.

Male. Ferruginous, except the femora, tibiae and tarsi very dark, almost black, and the flagellum blackish; clothed throughout with sparse, erect, pale hairs, the hairs on the front, vertex, pronotum, mesonotum, scutellum, and abdominal tergites tinged with golden ferruginous; second abdominal tergite with a distinct, posterior marginal fringe of pale, plumose hairs, the remaining tergites without fringes; head slightly narrower than the thorax; mandibles with a distinct dorsal carina extending their entire length, edentate at the tip and apparently with two small teeth near the tip, distinctly excised beneath, a distinct, blunt tooth subtending the emargination; clypeus slightly concave, distinctly depressed below the dorsal margin of the mandibles, the posterior margin not tuberculate medially; antennal tubercles distinctly, but not widely, separated; scape moderately punctate, with a single, longitudinal carina anteriorly; first segment of flagellum about four-fifths the length of the second; antennal scrobes not carinate above, but with a small, distinct tubercle nearer to the antennal tubercles than to the eyes; front with a small pit in front of the median ocellus and a shallow sulcus extending forward from it to between the antennal tubercles; front, vertex and genæ with small, very sparse punctures; ocelli moderate in size, the distance between the lateral ocelli and the eyes equal to twice the greatest diameter of a lateral ocellus; lateral areas of pronotum with moderate, close punctures, the median area almost impunctate; parapsidal furrows complete

from anterior to posterior margins of mesonotum; mesonotum with moderately small, sparse punctures; scutellum with moderate, very close, almost dense punctures; enclosed area on dorsum of propodeum composed of a pair of long, narrow areas, each about five times as long as broad, and flanked on each side by a broader area slightly more than half as long and broader anteriorly than posteriorly; remainder of dorsum and posterior face of propodeum distinctly reticulate; propleuræ finely, shallowly punctate; ventral area of mesopleuræ reticulate, except posteriorly glabrous; dorsal area of mesopleuræ finely punctate anteriorly, with moderate, shallow punctures posteriorly; metapleuræ glabrous, except ventrally punctate; sides of propodeum weakly punctate; mesosternum with a pair of small, acute teeth at the midline, the teeth slightly recurved posteriorly; tegulæ small, convex, glabrous, except that the anterior and inner margins are punctate and ferruginous pubescent; first abdominal segment slender, petiolate, the first tergite with strong, moderate, close punctures; second tergite glabrous, with small, very sparse punctures throughout; remaining tergites with fine, shallow, indistinct punctures; last tergite obscurely granulate, without a well defined pygidial area; first sternite with a weak, longitudinal ridge, the latter slightly elevated anteriorly into a small tooth; second sternite with moderate, separated punctures; felt line present on second sternite and more than half the length of the felt line on the second tergite; remaining sternites finely punctate; wings slightly infuscated; veins dark brown; cell 2nd R_1+R_2 acute at the tip, the length on the costal margin equal to the length of the stigma; cell $R+1st\ R_1$ long and narrow, its length equal to the length of cell 2nd R_1+R_2 ; cell R_5 receiving vein M_{3+4} before the middle; cell R_4 and vein M_2 entirely obsolete; legs clothed with sparse, pale hairs; calcaria pale yellowish. Length, 7 mm.

Holotype. Male, Cat. No. 52783 United States National Museum, Eagle Lake, Lassen County, California, July 31, 1936 (K. A. Salman).

Near to *fallax* Viereck and *ocellatus* Baker, both having the felt line on the second sternite more than half the length of the felt line on the second tergite, but differs from both in the almost black legs and dark fuscous flagellum.

Photopsis minutella Mickel, n. sp.

Female. Entirely ferruginous, except the femora and tibiæ blackish, and the flagellum pale ferruginous, paler than the head; front and vertex clothed with sparse, long, erect and recumbent, dark fuscous, almost black hairs; genæ and remainder of head

with pale pubescence; dorsum of thorax clothed with sparse, erect and recumbent, black hairs; remainder of pubescence of thorax pale; second abdominal tergite clothed with sparse, long, erect and recumbent, black hairs; tergites III to V with sparse, erect, black hairs; tergites II, III, IV and V and sternites II, III, IV and V, each with a thick fringe of pale, plumose hairs; remainder of abdominal pubescence above and beneath pale; head approximately the width of the thorax; mandibles slender, edentate at the tip, distinctly excised beneath near the base; antennal tubercles distinctly, but not widely, separated; first segment of flagellum scarcely longer than the pedicel, about equal in length to the second, and slightly shorter than the third; antennal scrobes not carinate above; front, vertex and genæ with moderate, close, indistinct punctures; thorax subrectangular, slightly narrowed anteriorly and posteriorly; humeral angles angulate, but not prominent; dorsum of thorax with moderate, dense punctures, becoming reticulate on the dorsum and posterior face of propodeum; propleuræ finely, indistinctly punctate; mesopleuræ glabrous, except the dorso-ventral ridge closely punctate and with long, erect, pale hairs; metapleuræ entirely glabrous; sides of propodeum glabrous, with a few, scattered, indistinct punctures, and a few, erect, pale hairs; scutellar scale entirely absent; first abdominal segment entirely sessile with the second; first tergite with small, close punctures; second tergite with moderately small, separated punctures; tergites III to V with fine, indistinct punctures; pygidial area distinct, margined laterally, weakly granulate and with weak, longitudinal striations visible in certain lights; first sternite with a median, longitudinal carina; second with small, close, indistinct punctures; remaining sternites finely, indistinctly punctate; legs clothed with pale pubescence; calcaria ferruginous. Length, 4 mm.

Holotype. Female, Cat. No. 52782 United States National Museum, Eagle Lake, Lassen County, California, July 31, 1936 (K. A. Salman). Paratypes. Two females, Eagle Lake, Lassen County, California, July 31, 1936 (K. A. Salman), in the collections of University of Minnesota and K. A. Salman.

Related to *capricornis* Rohwer, but differs in having the abdomen ferruginous, the flagellum pale ferruginous and in having thick fringes of plumose pubescence at the posterior margin of segments II, III, IV and V, both above and beneath. This is probably the female of *atripes*.

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THREE NEW SPECIES OF TEXANANUS

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Texananus bialtus DeLong, n. sp.

Resembling *latipex* in form and general appearance but more distinctly colored and dorsal portion of the ædeagus tapered and sharply pointed at apex. Length, 6.5 mm.

Vertex bluntly angled, one and one-half times as wide between eyes at base as median length.

Color: Vertex yellow with a brownish broken transverse band between the eyes. Scutellum with anterior portion rather heavily marked with brown. Elytra creamy-white, rather sparsely marked with dark brown ramose lines, the two posterior pale commissural spots distinct.

Genitalia: Male valve rather short and rounded, plates short with blunt tips. Styles long and narrow. Apices rounded, pointed on inner margin. In lateral view the ventral portion of the ædaegus is broader than in *latipex*, and the dorsal portion is gradually tapered to a pointed apex which is directed upward and anteriorly.

Holotype male, Davis Mountains, Texas, August 22, 1936, collected by J. N. Knull, in the author's collection.

Texananus pergrada DeLong, n. sp.

Resembling *ovatus* in form and general appearance but with ventral process of ædeagus very slender and unbranched. Length, 4.5-5.5 mm.

Vertex bluntly angled, about one and one-half times as wide between eyes at base as the length at middle.

Color variable; in well marked specimens with a brown spot